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July 13, 2017

Mr. Steven Renninger  
On-Scene Coordinator  
U.S. Environmental Protection Agency Region 5  
77 W. Jackson Boulevard  
Chicago, Illinois 60604

**Subject: Final Removal Assessment Report  
Lunkenheimer Foundry Site  
EPA Contract No. EP-S5-13-01  
Technical Direction Document No. 0001-1703-005  
Document Tracking No. 1628**

Dear Mr. Renninger:

Tetra Tech Inc. (Tetra Tech) is submitting the Final Removal Assessment Report for the Lunkenheimer Foundry Site. This draft letter report summarizes sampling activities conducted on April 25, 2017, and presents analytical results obtained through these sampling efforts. Additional efforts at this site may continue at your discretion. If additional activities are conducted, they will be summarized and results will be presented as an addendum to this report.

If you have any questions regarding this report, please call me at (262) 227-1049

Sincerely,

A handwritten signature in black ink, appearing to read 'Karl Schultz', with a horizontal line underneath.

Karl Schultz  
Project Manager

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager  
TDD File

**FINAL REMOVAL ASSESSMENT REPORT  
LUNKENHEIMER FOUNDRY SITE  
CINCINNATI, HAMILTON COUNTY, OHIO**

*Prepared for*

**U.S. Environmental Protection Agency**  
Emergency Response Branch  
Region 5  
77 W. Jackson Boulevard  
Chicago, IL 60606

*Submitted by*

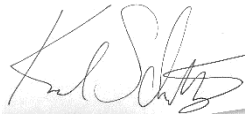
**Tetra Tech Inc.**  
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Chicago, IL 60606

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July 13, 2017

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## 1.0 INTRODUCTION

Under the Superfund Technical Assessment Response Team (START) Contract No. EP-S5-13-01, Technical Directional Document (TDD) No. 0001-1703-005, the U.S. Environmental Protection Agency (EPA) tasked Tetra Tech Inc. (Tetra Tech) to perform a removal assessment for the Lunkenheimer Foundry facility in Cincinnati, Ohio (Figure 1). The purpose of the site assessment was to document and characterize site conditions from the discovery of numerous orphaned drums and containers, drums and piles of foundry sand, and transformers labeled as containing polychlorinated biphenyl (PCB) oil. Tetra Tech was also tasked with the following activities:

- Develop and implement a site specific Health and Safety Plan and a Sampling and Analysis Plan
- Collect samples from unknown drums, piles of foundry sand, and PCB oil containing transformers
- Procure analytical services from a laboratory
- Perform validation of analytical data results from sampling activities
- Track costs related to sampling activities
- Evaluate potential threats posed by the Site to public health and the environment
- Develop a site assessment report of completed activities

This site draft assessment report documents sampling and site activities that took place at the Lunkenheimer Foundry site on April 25, 2017. The report discusses the site description and site background in Section 2.0, describes sampling activities in Section 3.0, provides a summary of analytical results in Section 4.0, provides conclusions in Section 5.0, and includes references in Section 6.0.

In addition, this site draft assessment report contains seven Appendices. Site Figures 1 through 3 are provided in Appendix A; analytical data tables are provided in Appendix B; photographic documentation is provided as Appendix C; field notes recorded by START are provided in Appendix D; laboratory reports are provided in Appendix E; the data validation report is provided in Appendix F; and Tetra Tech's Environmentally Preferred Practices in Appendix G.

## **2.0 SITE BACKGROUND**

This section describes the site location, the site description, and the project.

### **2.1 SITE LOCATION**

The Site is located at 1519 Tremont Street in Cincinnati, Hamilton County, Ohio (Appendix A, Figure 1). The geographical coordinates for the site are 39.126855° North latitude and -84.54927° West longitude. The Site is located on the corner of Beekman Street and Tremont Street with an approximately 150,000 square foot industrial building. The Site building is part of the former Lunkenheimer complex that included numerous manufacturing buildings between Queen City Avenue and Waverly Avenue. The adjacent buildings were formerly a part of the Lunkenheimer complex, but are now being utilized for storage or light manufacturing. There is another former industrial building attached to the foundry to the west, as well as a catwalk connecting the foundry to a former industrial building to the north that is now utilized for commercial use. The site is surrounded by industrial activity to the north and east and by commercial and residential properties to the south and west. The current layout is shown in Figure 2 in Appendix A.

### **2.2 SITE DESCRIPTION**

The Site is an abandoned foundry building, which consists of a five story, 150,000 square foot factory. The building was constructed in 1908 for the Lunkenheimer Foundry. Lunkenheimer manufactured various bronze, iron, and cast steel valves, utilizing the upper levels of the building as a foundry and the lower levels for storage and machine shop. It is unclear when Lunkenheimer ceased operations. From approximately 2009 until January 2017, the Cincinnati Valve Company (CVC) operated the Site building. CVC produced Lunkenheimer branded valves under a licensing agreement. During the period of CVC operation, the Star-Lett Corporation owned the Site building. The Site includes a 1.5-acre parcel property with an abandoned manufacturing building. The Site is currently vacant, with visual evidence of frequent trespassing and broken windows.

Throughout the building there are a number of orphaned containers containing unknown chemicals, empty containers, and piles/drums of foundry sand. On the ground floor, START discovered one metal drum with a corrosive label on it, several containers with flammable liquid stickers on them, and numerous unmarked 55-gallon drums. On the first floor, an abandoned lab was discovered that contained numerous unmarked containers and glassware, some of which contained liquid. Numerous acid and solvent containers were also located in the lab, labels included Hydrochloric Acid, Acetone, Ether,

Benzene, and Ethyl Acetate. START and EPA did not find anything of concern on the second floor. On the third floor, there are fiberboard drums of powder labeled as corrosive; the drums are in a state of deterioration and the powder has begun to spill out from the containers. There are also numerous piles of, and 55 gallon drums containing, foundry sand. START discovered capacitors and transformers labeled as containing PCBs on the fourth floor of the building, adjacent to the foundry area. Approximately 600 drums were documented in the Site building. There are four underground storage tanks (USTs) located under the sidewalk adjacent to Beekman Street which contain heating oil. USTs appear to be full, and when there is severe storms the USTs have had oil overflowing into the Beekman Street storm drain and nearby Mill Creek.

### 3.0 SITE ACTIVITIES

On March 27<sup>th</sup>, 2017, the Cincinnati Fire Department requested EPA's assistance to conduct an assessment and a potential emergency removal action at the Lunkenheimer Foundry Site. On March 28<sup>th</sup>, 2017, Cincinnati Fire Department, Ohio EPA, Cincinnati Metropolitan Sewer District, and EPA On-Scene Coordinator Steve Renninger toured the Lunkenheimer Site with representatives of both Taft Stettinius & Hollister LLP and TRC Solutions. Taft Stettinius & Hollister LLP is the law firm that represents the property owner and TRC Solutions is the law firm's environmental consultant. The following wastes were documented in the vacant Site building: PCB transformers, numerous piles of foundry sand, drums of metals waste, unknown drums and containers, corrosive waste, and ignitable waste. On April 11<sup>th</sup>, 2017, the Tetra Tech START project manager and EPA On-scene Coordinator (OSC) met on site to complete an initial site walkthrough. During this site walkthrough, Tetra Tech and EPA were accompanied by representatives from both Taft Stettinius & Hollister LLP and TRC Solutions. The site walkthrough focused on identifying potential sampling locations for the collection of unknown container samples, foundry sand samples and bulk oil samples. During the initial site walkthrough approximately 600 orphaned 55-gallon drums were observed throughout the building. Two fiberboard drums labeled as "corrosive" were found on the third floor in a deteriorated state with powder-like contents spilling onto the floor. An open top fiberboard drum containing powder and labelled as an "oxidizer" was also observed on the third floor. A 25 gallon steel drum labelled as "corrosive" was observed in the basement of the building. Throughout the building, foundry sand was found in piles on the floor, covering machinery, and found in hundreds of open top 55 gallon drums. Field screening was conducted by EPA START and with the use of an x-ray fluorescence (XRF) handheld analyzer, piles of foundry sand were found to have levels of lead as high as 38,800 parts per million (ppm). On the fourth floor of the building, four large transformers were observed. Two of the transformers were labelled as "contains PCBs" and two of the transformers were not labelled. Potential unknown container samples were based on container labels such as "corrosive" or "oxidizer" and location. Potential sampling locations for foundry sand were based on field screening results with the XRF handheld analyzer. Potential bulk PCB oil sample locations were based on the "contains PCB" labels, which were observed on the transformers on the fourth floor.

On April 25, 2017, Tetra Tech and EPA conducted multimedia sampling at the Site. Tetra Tech and EPA were accompanied by representatives of both Taft Stettinius & Hollister LLP and TRC Solutions. Further details on sampling activities and sample management activities are presented in Sections 3.1 and 3.2.

### 3.1 SAMPLING ACTIVITIES

Tetra Tech and EPA met on site on April 25, 2017, to collect multimedia samples to document site conditions and characterize the Site and the threat it poses to human health and the environment. Tetra Tech and EPA were accompanied by representatives of both Taft Stettinius & Hollister LLP and TRC Solutions. Tetra Tech and EPA conducted a site walkthrough prior to beginning sampling to identify final sampling locations. Tetra Tech and EPA identified 25 sampling locations at the Site; 10 liquid waste, 12 solid waste (including 3 duplicate samples), 4 foundry sand, and 2 bulk oil samples were collected. The sampling locations are shown in Figure 3 in Appendix A. Table 1 presents the sample identifiers, matrices, and sampling locations.

**TABLE 1  
SAMPLE SUMMARY**

<b>Sample Identifier</b>	<b>Matrix</b>	<b>Floor</b>	<b>Analytical</b>
LFS-BO-001-042517	Bulk Oil	4	PCBs
LFS-BO-002-042517	Bulk Oil	4	PCBs
LFS-FS-001-042517	Foundry Sand	3	TCLP Metals
LFS-FS-002-042517	Foundry Sand	3	TCLP Metals
LFS-FS-003-042517	Foundry Sand	4	TCLP Metals
LFS-FS-004-042517	Foundry Sand	4	TCLP Metals
LFS-LW-001-042517	Liquid Waste	G	pH
LFS-LW-002-042517	Liquid Waste	G	Flashpoint
LFS-LW-003-042517	Liquid Waste	G	Flashpoint
LFS-LW-004-042517	Liquid Waste	G	Flashpoint
LFS-LW-005-042517	Liquid Waste	3	pH
LFS-LW-006-042517	Liquid Waste	4	Flashpoint
LFS-LW-007-042517	Liquid Waste	1 (Lab)	pH
LFS-LW-008-042517	Liquid Waste	1 (Lab)	pH
LFS-LW-009-042517	Liquid Waste	1 (Lab)	Flashpoint
LFS-LW-010-042517	Liquid Waste	1 (Lab)	Flashpoint
LFS-SW-001-042517	Solid Waste	3	pH
LFS-SW-001-042517-DUP	Solid Waste	3	pH



Sample Identifier	Matrix	Floor	Analytical
LFS-SW-002-042517	Solid Waste	3	pH
LFS-SW-003-042517	Solid Waste	3	pH
LFS-SW-004-042517	Solid Waste	3	TCLP Metals
LFS-SW-004-042517-DUP	Solid Waste	3	TCLP Metals
LFS-SW-005-042517	Solid Waste	4	TCLP Metals
LFS-SW-006-042517	Solid Waste	4	TCLP Metals
LFS-SW-008-042517	Solid Waste	4	TCLP Metals
LFS-SW-008-042517-DUP	Solid Waste	4	TCLP Metals
LFS-SW-009-042517	Solid Waste	4	TCLP Metals
LFS-SW-007-042517	Solid Waste	4	Waste dilution for Metals

**Notes:**

BO Bulk Oil  
 DUP Duplicate Sample  
 FS Foundry Sand  
 LFS Lunkenheimer Foundry Site  
 LW Liquid Waste  
 PCB polychlorinated Biphenyls  
 SW Solid Waste  
 TCLP Toxicity characteristic leaching  
 procedure

### **3.1.1 Liquid Waste Samples**

A total of ten liquid waste samples were collected. six out of ten liquid waste samples collected were analyzed for flashpoint. Four out of ten liquid waste samples collected were analyzed for pH. No duplicate samples were collected from liquid waste samples due to a limited quantity. Liquid waste analytical results can be found in Section 4.1.

### **3.1.2 Solid Waste Samples**

A total of 12 solid waste samples were collected. Four out of 12 solid waste samples collected were analyzed for pH. Eight out of 12 solid waste samples collected were analyzed for toxicity characteristic leaching procedure (TCLP) metals. Three duplicate samples were collected (1 for pH and 2 for TCLP metals) from solid waste samples due to highly elevated field screening readings. Solid waste analytical results can be found in Section 4.2.

### **3.1.3 Foundry Sand Samples**

A total of four foundry samples were collected and analyzed for TCLP metals. No duplicate samples were collected from foundry sand samples. Foundry sand analytical results can be found in Section 4.3.

### **3.1.4 Bulk PCB Oil Samples**

A total of two bulk oil samples were collected. These samples were collected from the two transformers that were unlabeled. The two transformers that were labeled as “contains PCBs” could not be safely opened by sample personnel, so they were not sampled. Both bulk oil samples collected were analyzed for PCBs. No duplicate samples were collected from bulk oil samples due to difficulty accessing the bulk oil. Bulk oil analytical results can be found in Section 4.4.

## **3.2 SAMPLE COLLECTION METHODS AND ANALYSIS**

Due to the unknown nature of the materials in closed and unlabeled drums and their associated hazards, all samples of unknown containers were collected in Level B personal protective equipment. All liquid and bulk materials were collected directly from the original container and contents were transferred directly into laboratory cleaned and certified bottleware. All liquid waste samples and PCB bulk oil samples were collected from their container or drum using a dedicated drum thief or COLIWASA. Samples were transferred from the drum thief or COLIWASSA directly into laboratory cleaned and certified bottleware for analysis of corrosivity, flash point, or PCB content. The samples were collected in accordance with Tetra Tech SOP NO.008-2 “Containerized Liquid, Sludge, and Slurry Sampling” (Tetra Tech 2000). The foundry sand, and solid waste samples were collected using dedicated plastic

scoops. Samples were transferred from the plastic scoops into cleaned and certified bottleware. The foundry sand was analyzed for TCLP metals and the solid waste samples were analyzed for pH or TCLP metals. The solid samples were collected in accordance with Tetra Tech SOP NO. 007-2 “Bulk Materials Sampling” (Tetra Tech 1999).

### **3.3 SAMPLE MANAGEMENT**

All samples collected during this sampling event were handled and packaged in accordance with the Tetra Tech “Quality Assurance Project Plan (QAPP) for START” (Tetra Tech 2016). All shipping containers were properly labeled with chain-of-custody seals and were delivered with signed chain-of-custody forms (Appendix E) and appropriate hazard warnings for laboratory personnel. In addition, Tetra Tech photographed the sites and documented activities in a logbook in accordance with Tetra Tech SOP No. 024, “Recording of Notes in Field Logbook” (Tetra Tech 2008), and Tetra Tech’s QAPP for START (Tetra Tech 2016).

All multimedia samples collected from the site, including quality assurance and quality control (QA/QC) samples, were shipped to CT Laboratories, 1230 Lange Court, Baraboo, WI 53913.

## **4.0 ANALYTICAL RESULTS**

Tetra Tech reviewed all multimedia sampling results. Results are summarized in the Data Summary Tables 1 and 2 provided in Appendix B. The validated Level IV analytical data packages, including signed chain of custody forms, are provided in Appendix E, and the data validation report is provided in Appendix F.

### **4.1 LIQUID WASTE RESULTS**

A total of ten liquid waste samples were collected. Four out of ten liquid waste samples collected were analyzed for pH. Six out of ten liquid waste samples collected were analyzed for flashpoint.

#### **4.1.1 pH of Liquid Waste Samples**

According to Code of Federal Regulations (C.F.R.) 261.22, liquid waste having a pH level less than 2.0 standard units (SU) or greater than 12.5 SU characterizes that liquid waste as hazardous waste for corrosivity (D002). Three out of four liquid waste samples analyzed for pH verified the characteristic of a hazardous waste for corrosivity (D002). LFS-LW-001 (pH = 14) documented liquid waste having a pH greater than 12.5 SU. LFS-LW-007 (pH = <0.1) and LFS-LW-008 (pH = <0.1) documented liquid waste having a pH less than 2.0 SU.

#### **4.1.2 Flash Point of Liquid Waste Samples**

According to C.F.R. 261.22, liquid waste having a flashpoint less than 140°F characterizes that liquid waste as hazardous waste for ignitability (D001). Two out of six liquid waste samples analyzed for flashpoint verified the characteristic of a hazardous waste for ignitability (D001). LFS-LW-006 (flashpoint = 120.6°F) and LFS-LW-010 (flashpoint = 100.5°F) both documented liquid waste having a flashpoint less than 140°F.

### **4.2 SOLID WASTE RESULTS**

A total of 12 solid waste samples were collected. Four out of 12 solid waste samples collected were analyzed for pH, 7 out of 12 solid waste samples collected were analyzed for TCLP metals, and 1 out of 12 solid waste samples collected were analyzed for metals. The lab indicated one sample (LFS-SW-007) received could not be analyzed for TCLP metals. Email correspondence from CT Laboratories personnel indicated: “We will not be able to perform the TCLP extraction for Sample # 860109 (LFS-SW-007-042517) due to the sample matrix. This sample will be analyzed as a waste dilution for metals and reported in mg/kg units rather than mg/L.” Analytical results for sample LFS-SW-007-042517 are presented in Table 2 in Appendix B. Other solid waste sample analytical results are presented in Table 1.

#### **4.2.1 pH of Solid Waste Samples**

According to C.F.R. 261.22, solid waste having a pH level less than 2.0 SU or greater than 12.5 SU characterizes that waste as hazardous waste for corrosivity (D002). Three out of three solid waste samples analyzed for pH did not indicate pH below 2.0 SU or above 12.5 SU, which indicates these samples did not verify the characteristic of a hazardous waste for corrosivity.

#### **4.2.2 TCLP Metals of Solid Waste Samples**

According to C.F.R. 261.24, solid waste having concentrations above TCLP metals regulatory levels characterizes that solid waste as hazardous waste for toxicity (D008). Three out of five solid waste samples analyzed for TCLP metals verified the characteristic of a hazardous waste for toxicity (D008). LFS-SW-006 (lead [Pb]=34 mg/L, cadmium [Cd]=2.3 mg/L), LFS-SW-008 (Pb=30 mg/L, Cd=2.9 mg/L), and LFS-SW-009 (Pb=30 mg/L, Cd=2 mg/L), exceeded TCLP metals regulatory levels for lead (5 mg/L) and cadmium (1 mg/L).

#### **4.2.3 Metals of Solid Waste Samples**

Due to the matrix of the solid waste sample submitted, LFS-SW-007 was analyzed as a waste dilution for metals instead of TCLP metals. Analytical data indicated results for LFS-SW-007 of 31,200 mg/kg for lead, exceeding the EPA residential RML of 400 mg/kg, and 662 mg/kg for cadmium, exceeding the EPA residential RML of 210 mg/kg.

### **4.3 FOUNDRY SAND RESULTS**

A total of four foundry samples were collected. All four foundry sand samples collected were analyzed for TCLP metals.

#### **4.3.1 TCLP Metals of Foundry Sand Samples**

According to C.F.R. 261.24, solid waste having concentrations above TCLP metals regulatory levels characterizes that solid waste as hazardous waste for toxicity (D008). Three out of four foundry sand samples analyzed for TCLP metals verified the characteristic of a hazardous waste for toxicity (D008). LFS-FS-001 (Pb=9.3 mg/L), LFS-FS-002 (Pb=12 mg/L), and LFS-FS-003 (Pb=6.9 mg/L), exceeded TCLP metals regulatory levels for lead (5 mg/L).

### **4.4 BULK PCB OIL RESULTS**

A total of 2 bulk oil samples were collected. These samples were collected from the two transformers on the fourth floor that were unlabeled. Both bulk oil samples collected were analyzed for PCBs. Both bulk oil samples collected did not exceed EPA residential removal management levels (RMLs). The two

transformers that were labeled as “contains PCBs” could not be safely opened by the sample team, thus they were not sampled.

## **5.0 CONCLUSIONS**

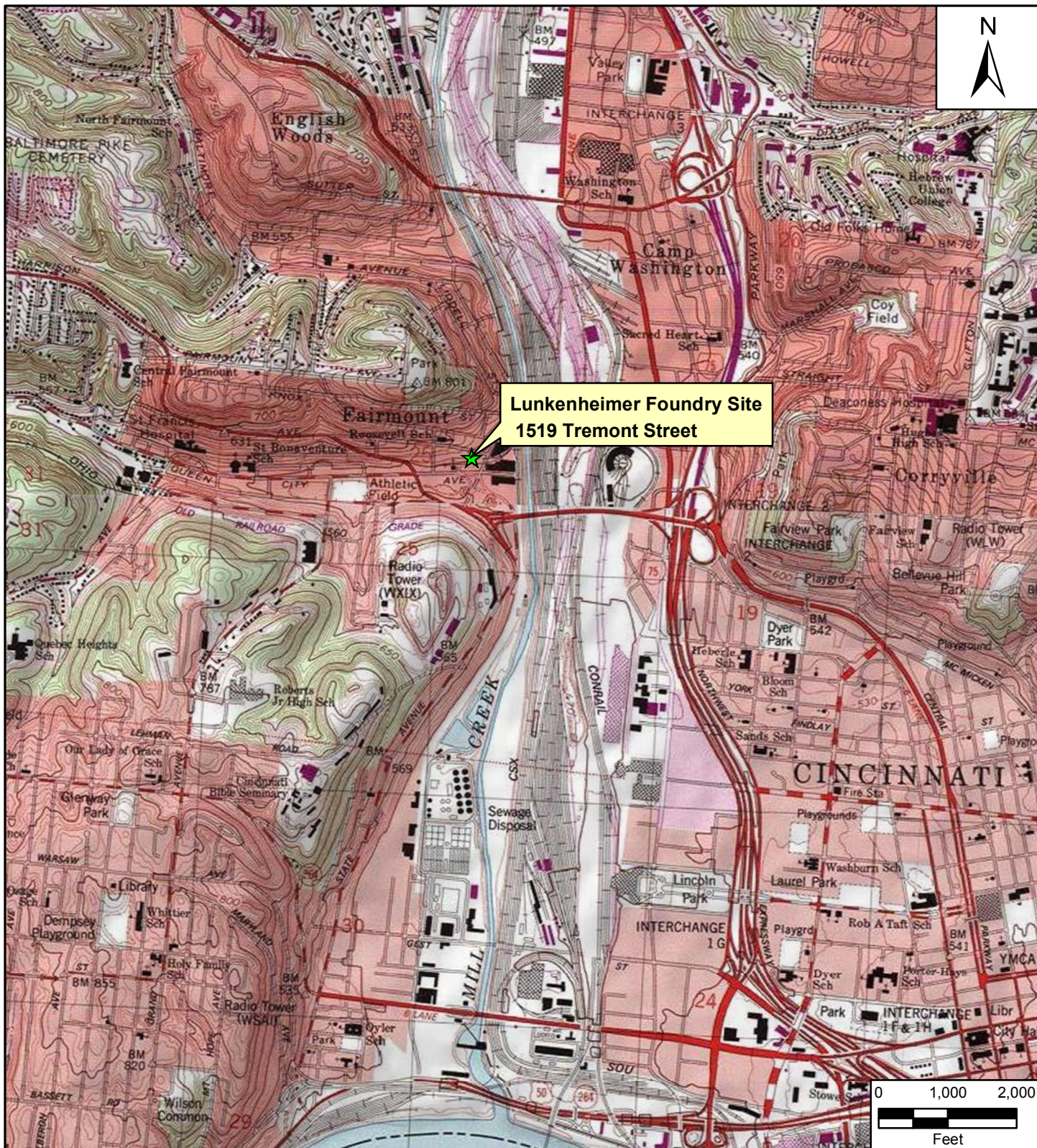
Analytical results confirmed the presence of hazardous substances, pollutants, or contaminants at the Site as defined by Section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), including the presence of corrosives, ignitable hazards, and elevated levels of metals waste. There is a potential for the migration of these materials into the environment and on-site storm water drains due to a leaking roof and broken windows. Commercial and light industrial areas are located within 100 feet of the Site and evidence of trespassing and vandalism were documented during the site investigation. These factors indicate potential exposure pathways to nearby human receptors, including nearby commercial areas from the hazardous substances, pollutants, or contaminants on-site. Future trespassers could cause an accidental or intentional release of hazardous materials and their contact with hazardous materials is also possible. Potential exposure could occur through each of these migration pathways.

## **6.0 REFERENCES**

- Tetra Tech Inc. 2008. Standard Operating Procedure No. 024, Revision 1, "Recording of Notes in Field Logbooks."
- Tetra Tech In. 2000. Standard Operating Procedure No. 008-02, "Containerized Liquid, Sludge, and Slurry Sampling."
- Tetra Tech Inc. 1999. Standard Operating Procedure No. 007-02, "Bulk Materials Sampling"
- Tetra Tech Inc. 2009b. Standard Operating Procedure No. 009, Revision 4, "Surface Water Sampling."
- Tetra Tech Inc. 2016. Quality Assurance Project Plan for START. June. Prepared for EPA under Contract No. EP-S5-13-01.

**APPENDIX A**  
**SITE FIGURES**





★ Site Location

Base Map Source: ESRI USA Topo Maps map service

EPA Contract No.: EP-S5-13-01  
TDD No.: 0001/S05-0001-1703-005

Lunkenheimer Foundry Site - RS  
1519 Tremont Street, Cincinnati, Ohio

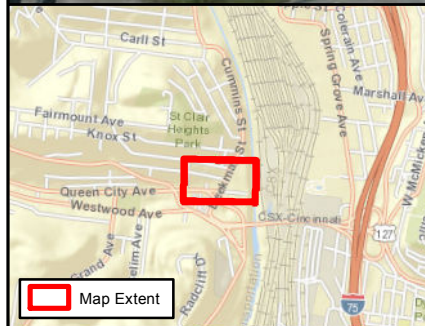
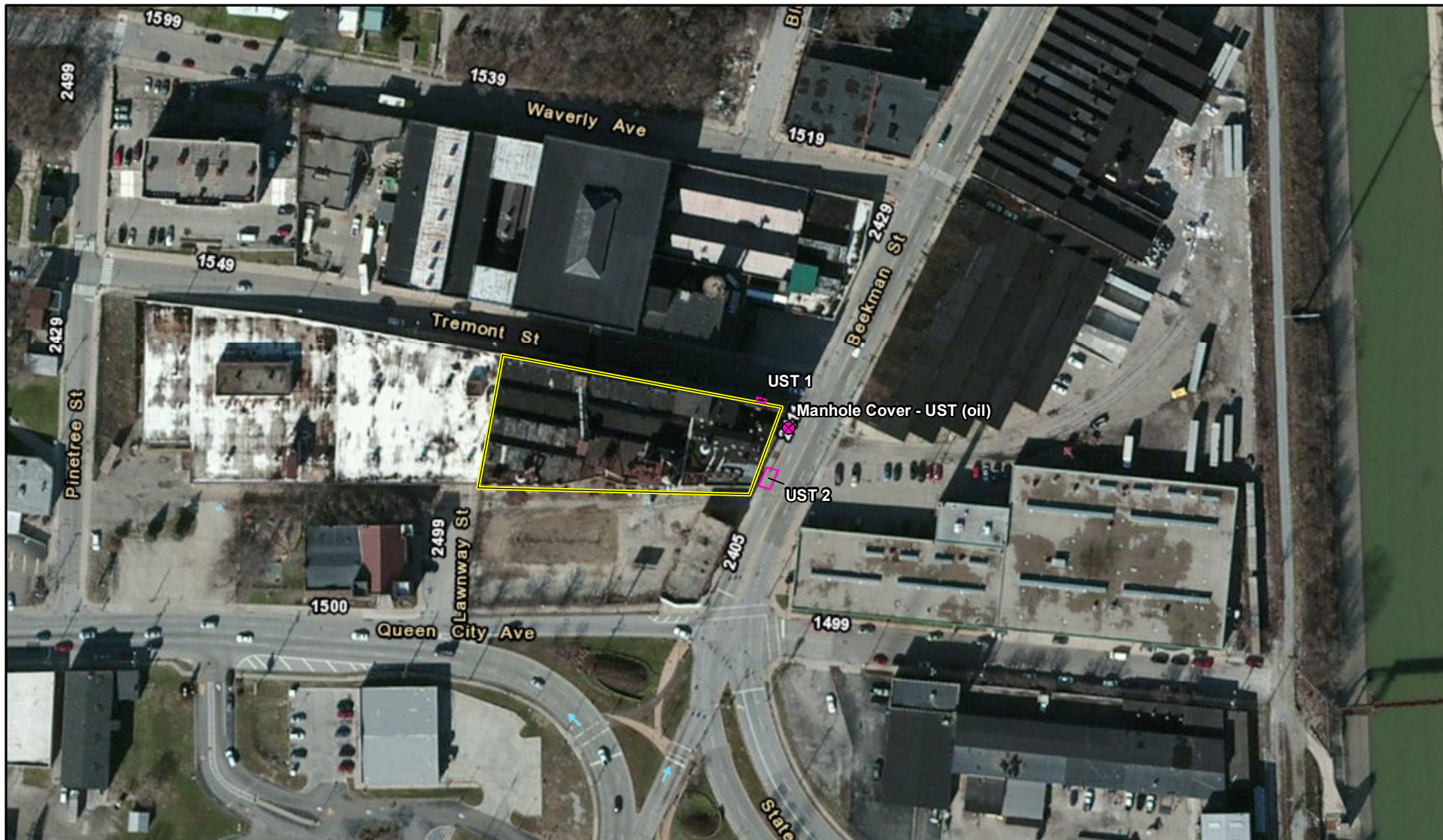
**Figure 1**  
**Site Location Map**



Prepared For: U.S. EPA START

Prepared By: MSG - KRB



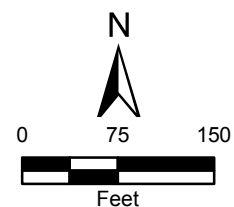


### Legend

- Manhole Cover - UST (oil)
- UST Location
- Building Footprint

Aerial Source: ESRI World Imagery Service / USDA FSA NAIP2015

EPA Contract No.: EP-S5-13-01  
TDD No.: 0001/S05-0001-1703-005



Lunkenheimer Foundry Site - RS  
1519 Tremont Street, Cincinnati, Ohio

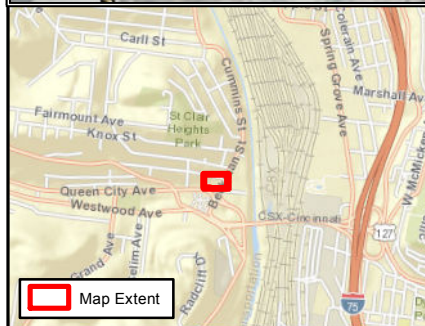
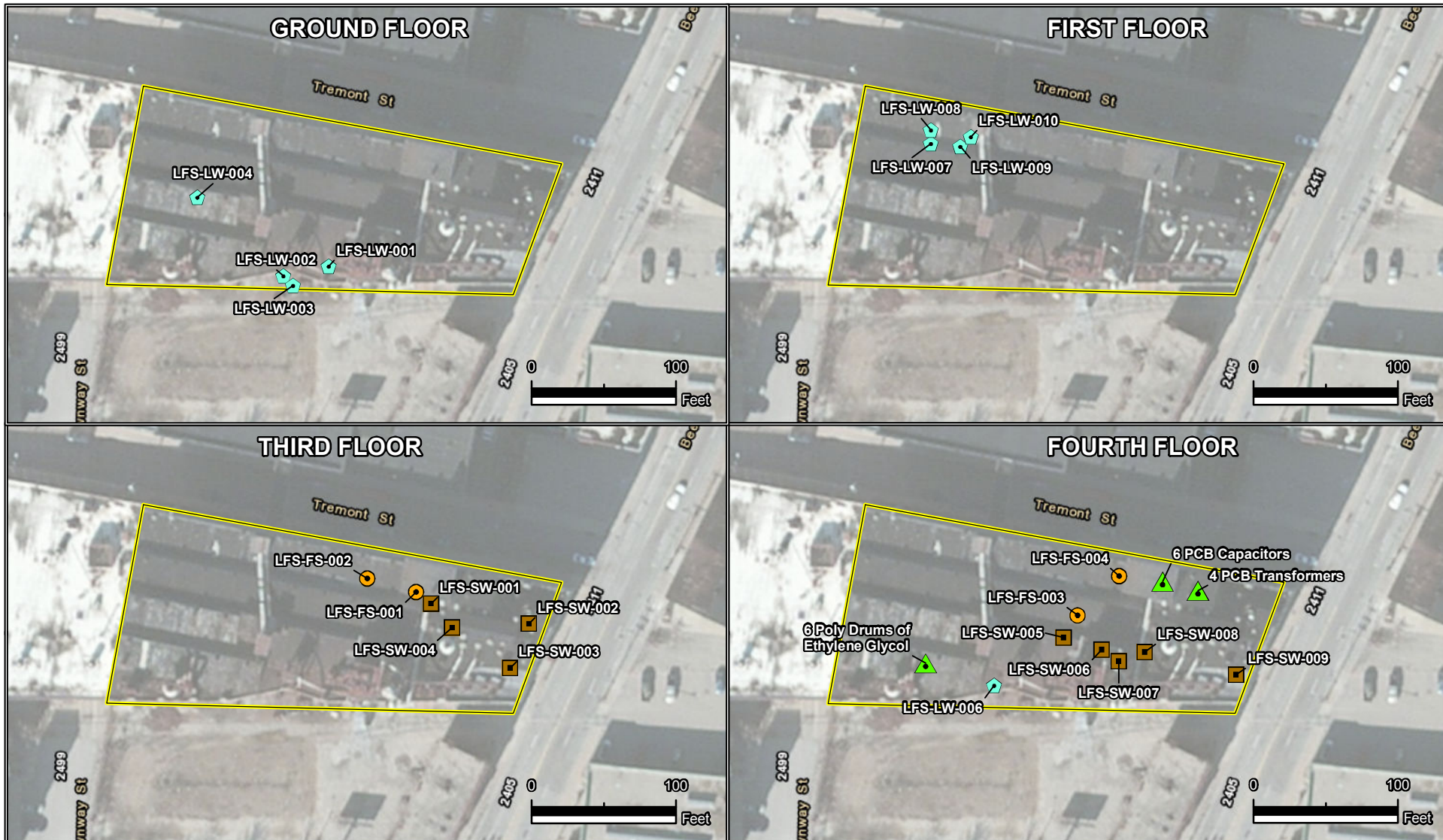
**Figure 2**  
**Site Footprint**



Prepared For: U.S. EPA START

Prepared By: MSG - KRB





**Legend**

- Foundry Sand Sample
- ◊ Liquid Waste Sample
- Solid Waste Sample
- ▲ Waste Items
- Building Footprint

Aerial Source: ESRI World Imagery Service / USDA FSA NAIP2015

EPA Contract No.: EP-S5-13-01  
TDD No.: 0001/S05-0001-1703-005



Lunkenheimer Foundry Site - RS  
1519 Tremont Street, Cincinnati, Ohio

**Figure 3**  
**Sampling Locations**



Prepared For: U.S. EPA START

Prepared By: MSG - KRB

**APPENDIX B**  
**TABLES**

**TABLE 1**  
**FOUNDRY SAND AND SOLID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-FS-001-042517		LFS-FS-002-042517		LFS-FS-003-042517		LFS-FS-004-042517		LFS-SW-001-042517	
Matrix :				Foundry Sand		Foundry Sand		Foundry Sand		Foundry Sand		Solid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017		4/25/2017		4/25/2017	
Analyte	CAS #	Analytical Method	Regulatory Level	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Metals (mg/L)</b>													
Arsenic	7440-38-2	SW 6010	5 <sup>a</sup>	0.011	J	0.004	U	0.004	U	0.004	U	NS	
Barium	7440-39-3	SW 6010	100 <sup>a</sup>	0.26		0.25		0.26		0.081		NS	
Cadmium	7440-43-9	SW 6010	1 <sup>a</sup>	0.15		0.1		0.14		0.12		NS	
Chromium	7440-47-3	SW 6010	5 <sup>a</sup>	0.01		0.0035	J	0.008		0.12		NS	
Lead	7439-92-1	SW 6010	5 <sup>a</sup>	9.3		12		6.9		0.19		NS	
Selenium	7439-97-6	SW 6010	0.2 <sup>a</sup>	0.0022	U	0.0022	U	0.0022	U	0.0022	U	NS	
Silver	7782-49-2	SW 6010	1 <sup>a</sup>	0.0007	U	0.0007	U	0.0007	U	0.0024	J	NS	
Mercury	7440-22-4	SW7470A	5 <sup>a</sup>	0.00003	U	0.00003	U	0.000093	J	0.00003	U	NS	
<b>Other</b>													
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	NS		NS		NS		NS		11	J
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	NS		NS		NS		NS		NS	

**Notes:**

mg/L Milligram per liter

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample result exceeds regulatory level.

<sup>a</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.24 maximum concentration of contaminant for the hazardous waste toxicity characteristic.

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.

<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

**TABLE 1  
FOUNDRY SAND AND SOLID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-SW-001-042517-DUP		LFS-SW-002-042517		LFS-SW-003-042517		LFS-SW-004-042517		LFS-SW-004-042517-DUP	
Matrix :				Solid		Solid		Solid		Solid		Solid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017		4/25/2017		4/25/2017	
Analyte	CAS #	Analytical Method	Regulatory Level	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Metals (mg/L)</b>													
Arsenic	7440-38-2	SW 6010	5 <sup>a</sup>	NS		NS		NS		0.0099	J	0.0052	J
Barium	7440-39-3	SW 6010	100 <sup>a</sup>	NS		NS		NS		0.16		0.16	
Cadmium	7440-43-9	SW 6010	1 <sup>a</sup>	NS		NS		NS		0.00043	J	0.0029	
Chromium	7440-47-3	SW 6010	5 <sup>a</sup>	NS		NS		NS		0.0006	U	0.0006	U
Lead	7439-92-1	SW 6010	5 <sup>a</sup>	NS		NS		NS		0.74		0.56	
Selenium	7439-97-6	SW 6010	0.2 <sup>a</sup>	NS		NS		NS		0.0022	U	0.0022	U
Silver	7782-49-2	SW 6010	1 <sup>a</sup>	NS		NS		NS		0.0012	J	0.0007	J
Mercury	7440-22-4	SW7470A	5 <sup>a</sup>	NS		NS		NS		0.00003	U	0.00003	U
<b>Other</b>													
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	10		11	J	8		NS		NS	
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	NS		NS		NS		NS		NS	

**Notes:**

mg/L Milligram per liter

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample result exceeds regulatory level.

<sup>a</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.24 maximum concentration of contaminant for the hazardous waste toxicity characteristic.

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.

<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

**TABLE 1  
FOUNDRY SAND AND SOLID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-SW-005-042517		LFS-SW-006-042517		LFS-SW-008-042517		LFS-SW-008-042517-DUP		LFS-SW-009-042517	
Matrix :				Solid		Solid		Solid		Solid		Solid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017		4/25/2017		4/25/2017	
Analyte	CAS #	Analytical Method	Regulatory Level	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Metals (mg/L)</b>													
Arsenic	7440-38-2	SW 6010	5 <sup>a</sup>	0.011	J	0.01	J	0.0074	J	0.0077	J	0.0079	J
Barium	7440-39-3	SW 6010	100 <sup>a</sup>	0.017		0.04		0.066		0.083		0.052	
Cadmium	7440-43-9	SW 6010	1 <sup>a</sup>	0.81 <sup>d</sup>		2.3 <sup>d</sup>		2.9 <sup>d</sup>		2.7 <sup>d</sup>		2 <sup>d</sup>	
Chromium	7440-47-3	SW 6010	5 <sup>a</sup>	0.0072		0.0006	U	0.0012	J	0.0013	J	0.00077	J
Lead	7439-92-1	SW 6010	5 <sup>a</sup>	4.7		34		30		27		30	
Selenium	7439-97-6	SW 6010	0.2 <sup>a</sup>	0.013		0.037		0.043		0.037		0.027	
Silver	7782-49-2	SW 6010	1 <sup>a</sup>	0.0014	J	0.0035	J	0.0032	J	0.0031	J	0.0031	J
Mercury	7440-22-4	SW7470A	5 <sup>a</sup>	0.00098		0.0029		0.0026		0.0022		0.0035	
<b>Other</b>													
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	NS		NS		NS		NS		NS	
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	NS		NS		NS		NS		NS	

**Notes:**

mg/L Milligram per liter

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample result exceeds regulatory level.

<sup>a</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.24 maximum concentration of contaminant for the hazardous waste toxicity characteristic.

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.

<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

**TABLE 2**  
**BULK OIL AND LIQUID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-BO-001-042517		LFS-BO-002-042517		LFS-SW-007-042517		LFS-LW-001-042517		LFS-LW-002-042517	
Matrix :				Bulk Oil		Bulk Oil		Solid		Liquid		Liquid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017		4/25/2017		4/25/2017	
Compound	CAS #	Analytical Method	Screening Levels	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Polychlorinated Biphenyls (PCB) (µg/kg)</b>													
Aroclor-1016	12674-11-2	SW8082	12000 <sup>a</sup>	500 <sup>d</sup>	U	500 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1221	11104-28-2	SW8082	20000 <sup>a</sup>	700 <sup>d</sup>	U	700 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1232	11141-16-5	SW8082	17000 <sup>a</sup>	900 <sup>d</sup>	U	900 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1242	53469-21-9	SW8082	23000 <sup>a</sup>	700 <sup>d</sup>	U	700 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1248	12672-29-6	SW8082	23000 <sup>a</sup>	700 <sup>d</sup>	U	700 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1254	11097-69-1	SW8082	3500 <sup>a</sup>	900 <sup>d</sup>	U	900 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1260	11096-82-5	SW8082	24000 <sup>a</sup>	600 <sup>d</sup>	U	600 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1262	37324-23-5	SW8082	NC	700 <sup>d</sup>	U	700 <sup>d</sup>	U	NS		NS		NS	
Aroclor-1268	11100-14-4	SW8082	NC	500 <sup>d</sup>	U	500 <sup>d</sup>	U	NS		NS		NS	
<b>Metals (mg/kg)</b>													
Arsenic	7440-38-2	SW 6010	68 <sup>a</sup>	NS		NS		20.5 <sup>e</sup>		NS		NS	
Barium	7440-39-3	SW 6010	46,000 <sup>a</sup>	NS		NS		22.7 <sup>e</sup>		NS		NS	
Cadmium	7440-43-9	SW 6010	210 <sup>a</sup>	NS		NS		662 <sup>f</sup>		NS		NS	
Chromium	7440-47-3	SW 6010	NC	NS		NS		14.1 <sup>e</sup>		NS		NS	
Lead	7439-92-1	SW 6010	400 <sup>a</sup>	NS		NS		31,200 <sup>f</sup>		NS		NS	
Selenium	7439-97-6	SW 6010	1,200 <sup>a</sup>	NS		NS		23.3 <sup>e</sup>		NS		NS	
Silver	7782-49-2	SW 6010	1,200 <sup>a</sup>	NS		NS		65.7 <sup>f</sup>		NS		NS	
Mercury	7440-22-4	SW7471B	33 <sup>a</sup>	NS		NS		0.42	J	NS		NS	
<b>Other</b>													
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	NS		NS		NS		14	J	NS	
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	NS		NS		NS		NS		>140	

**Notes:**

µg/kg Microgram per kilogram

mg/kg Milligram per kilogram

NC No criteria

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample concentration exceeds screening level

<sup>a</sup> EPA Removal Management Levels (May 2016) for residential soil are based on a target risk of 1.0 E-04 for carcinogens and a target hazard quotient of 3 for non-carcinogens. RMLs are available at: <http://www2.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.

<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

<sup>e</sup> Sample dilution factor of 3

<sup>f</sup> Sample dilution factor of 100



**TABLE 2**  
**BULK OIL AND LIQUID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-LW-003-042517		LFS-LW-004-042517		LFS-LW-005-042517		LFS-LW-006-042517		LFS-LW-007-042517	
Matrix :				Liquid		Liquid		Liquid		Liquid		Liquid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017		4/25/2017		4/25/2017	
Compound	CAS #	Analytical Method	Screening Levels	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Polychlorinated Biphenyls (PCB) (µg/kg)</b>													
Aroclor-1016	12674-11-2	SW8082	12000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1221	11104-28-2	SW8082	20000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1232	11141-16-5	SW8082	17000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1242	53469-21-9	SW8082	23000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1248	12672-29-6	SW8082	23000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1254	11097-69-1	SW8082	3500 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1260	11096-82-5	SW8082	24000 <sup>a</sup>	NS		NS		NS		NS		NS	
Aroclor-1262	37324-23-5	SW8082	NC	NS		NS		NS		NS		NS	
Aroclor-1268	11100-14-4	SW8082	NC	NS		NS		NS		NS		NS	
<b>Metals (mg/kg)</b>													
Arsenic	7440-38-2	SW 6010	68 <sup>a</sup>	NS		NS		NS		NS		NS	
Barium	7440-39-3	SW 6010	46,000 <sup>a</sup>	NS		NS		NS		NS		NS	
Cadmium	7440-43-9	SW 6010	210 <sup>a</sup>	NS		NS		NS		NS		NS	
Chromium	7440-47-3	SW 6010	NC	NS		NS		NS		NS		NS	
Lead	7439-92-1	SW 6010	400 <sup>a</sup>	NS		NS		NS		NS		NS	
Selenium	7439-97-6	SW 6010	1,200 <sup>a</sup>	NS		NS		NS		NS		NS	
Silver	7782-49-2	SW 6010	1,200 <sup>a</sup>	NS		NS		NS		NS		NS	
Mercury	7440-22-4	SW7471B	33 <sup>a</sup>	NS		NS		NS		NS		NS	
<b>Other</b>													
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	NS		NS		12	J	NS		0.1	J
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	>140		>140		NS		120.6		NS	

**Notes:**

µg/kg Microgram per kilogram

mg/kg Milligram per kilogram

NC No criteria

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample concentration exceeds screening level

<sup>a</sup> EPA Removal Management Levels (May 2016) for residential soil are based on a target risk of 1.0 E-04 for carcinogens and a target hazard quotient of 3 for non-carcinogens. RMLs are available at: <http://www2.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.

<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

<sup>e</sup> Sample dilution factor of 3

<sup>f</sup> Sample dilution factor of 100

**TABLE 2**  
**BULK OIL AND LIQUID WASTE ANALYTICAL RESULTS**

Sample Number :				LFS-LW-008-042517		LFS-LW-009-042517		LFS-LW-010-042517	
Matrix :				liquid		Liquid		Liquid	
Laboratory:				CT Laboratories		CT Laboratories		CT Laboratories	
Sample Date:				4/25/2017		4/25/2017		4/25/2017	
Compound	CAS #	Analytical Method	Screening Levels	Value	Tt Qualifier	Value	Tt Qualifier	Value	Tt Qualifier
<b>Polychlorinated Biphenyls (PCB) (µg/kg)</b>									
Aroclor-1016	12674-11-2	SW8082	12000 <sup>a</sup>	NS		NS		NS	
Aroclor-1221	11104-28-2	SW8082	20000 <sup>a</sup>	NS		NS		NS	
Aroclor-1232	11141-16-5	SW8082	17000 <sup>a</sup>	NS		NS		NS	
Aroclor-1242	53469-21-9	SW8082	23000 <sup>a</sup>	NS		NS		NS	
Aroclor-1248	12672-29-6	SW8082	23000 <sup>a</sup>	NS		NS		NS	
Aroclor-1254	11097-69-1	SW8082	3500 <sup>a</sup>	NS		NS		NS	
Aroclor-1260	11096-82-5	SW8082	24000 <sup>a</sup>	NS		NS		NS	
Aroclor-1262	37324-23-5	SW8082	NC	NS		NS		NS	
Aroclor-1268	11100-14-4	SW8082	NC	NS		NS		NS	
<b>Metals (mg/kg)</b>									
Arsenic	7440-38-2	SW 6010	68 <sup>a</sup>	NS		NS		NS	
Barium	7440-39-3	SW 6010	46,000 <sup>a</sup>	NS		NS		NS	
Cadmium	7440-43-9	SW 6010	210 <sup>a</sup>	NS		NS		NS	
Chromium	7440-47-3	SW 6010	NC	NS		NS		NS	
Lead	7439-92-1	SW 6010	400 <sup>a</sup>	NS		NS		NS	
Selenium	7439-97-6	SW 6010	1,200 <sup>a</sup>	NS		NS		NS	
Silver	7782-49-2	SW 6010	1,200 <sup>a</sup>	NS		NS		NS	
Mercury	7440-22-4	SW7471B	33 <sup>a</sup>	NS		NS		NS	
<b>Other</b>									
pH	pH	SW9045	≤2 or ≥12.5 S.U. <sup>b</sup>	0.1	J	J		NS	
Flashpoint	FLASHPT	SW1010	<140 °F <sup>c</sup>	NS		>140		100.5	

**Notes:**

µg/kg Microgram per kilogram

mg/kg Milligram per kilogram

NC No criteria

NS Not sampled

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Sample concentration exceeds screening level

<sup>a</sup> EPA Removal Management Levels (May 2016) for residential soil are based on a target risk of 1.0 E-04 for carcinogens and a target hazard quotient of 3 for non-carcinogens. RMLs are available at: <http://www2.epa.gov/risk/regional-removal-management-levels-chemicals-rmls>

<sup>b</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.22 maximum pH standard for hazardous waste corrosivity characteristic.



<sup>c</sup> EPA Title 40 Code of Federal Regulations (CFR) Section 261.21 maximum flashpoint temperature standard for hazardous waste ignitability characteristic.

<sup>d</sup> Sample dilution factor of 10

<sup>e</sup> Sample dilution factor of 3

<sup>f</sup> Sample dilution factor of 100



**APPENDIX C**  
**PHOTOGRAPHIC DOCUMENTATION**

<b>Sample Summary</b> <b>Lunkenheimer Foundry Site</b> <b>Cincinnati, Hamilton County, Ohio</b>		
Sample Designation	LFS-LW-001-042517	LFS-LW-006-042517
Container Type	Steel Drum	Metal Container
Matrix	Liquid	Liquid
Label Information	Corrosive 	Magnus Simple 
Field Screening Results		
Multi-Rae VOCs Reading	N/A	N/A
pH	13-14 SU	N/A
Analytical Results		
pH	14 SU <b>&gt;12.5 (Caustic)</b>	N/A
Flashpoint	N/A	120.6 °F <b>(Less than 140°F = Flammable)</b>

Notes:

LFS Lunkenheimer Foundry Site  
 VOCs Volatile Organic Compounds  
 ppb parts per billion  
 N/A not analyzed  
 °F Fahrenheit  
 SU Standard Units  
 U Analyzed but not detected above the method detection limit

Samples were submitted to CT Laboratory for analysis under TDD No. S05-0001-1703-005.  
 Photographed by Karl Schultz

<b>Sample Summary</b> <b>Lunkenheimer Foundry Site</b> <b>Cincinnati, Hamilton County, Ohio</b>		
Sample Designation	LFS-LW-007-042517	LFS-LW-008-042517
Container Type	Glass Beaker	Glass Beaker
Matrix	Liquid	Liquid
Label Information	N/A 	N/A 
Field Screening Results		
Multi-Rae VOCs Reading	N/A	N/A
pH	2 SU	2 SU
Lab Results		
Flashpoint	N/A	N/A
pH	<0.1 SU <b>Less than 2.5 pH (Corrosive)</b>	<0.1 SU <b>Less than 2.5 pH (Corrosive)</b>

Notes:

LFS Lunkenheimer Foundry Site

VOCs Volatile Organic Compounds

N/A not analyzed



°F Fahrenheit

SU Standard Units

U Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.

Photographed by Karl Schultz

Sample Summary Lunkenheimer Foundry Site Cincinnati, Hamilton County, Ohio				
Sample Designation	LFS-LW-010-042517		LFS-SW-006-042517	
Container Type	Metal 5 gallon container		Pile on foundry line equipment	
Matrix	Liquid		Solids	
Label Information	<div>Butyl Acetate <small>Apr 25, 2017, 14:02:01 39.12730297,-84.54650329</small></div> 		<div>N/A</div>  <div><small>Apr 25, 2017, 11:49:53 39.12667402,-84.54568136</small></div>	
Field Screening Results				
Multi-Rae VOCs Reading	N/A		XRF Reading – 3.88% for Lead	
pH	N/A		N/A	
Lab Results				
Flashpoint	100.5 °F (Less than 140°F = Flammable)	Compound	TCLP Regulatory Level	Prelim Results
		Lead	5 mg/L	34 mg/L

Notes:

LFS Lunkenheimer Foundry Site

VOCs Volatile Organic Compounds

N/A not analyzed



°F Fahrenheit

SU Standard Units

U Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.

Photographed by Karl Schultz

Sample Summary Lunkenheimer Foundry Site Cincinnati, Hamilton County, Ohio				
Sample Designation	LFS-SW-007-042517		LFS-SW-008-042517	
Container Type	Pile on Foundry Equipment		Pile on Foundry Equipment	
Matrix	Solids		Solids	
Label Information	N/A 		N/A 	
Field Screening Results				
XRF Reading	2.58% for Lead		1.86% for Lead	
Lab Results				
Compound	TCLP Regulatory Level	Preliminary Results	TCLP Regulatory Level	Preliminary Results
Arsenic	5 mg/L	20.5 mg/L	5 mg/L	-
Cadmium	1 mg/L	662 mg/L	1 mg/L	2.9 mg/L
Chromium	5 mg/L	14.1 mg/L	5 mg/L	-
Lead	5 mg/L	31,200 mg/L	5 mg/L	30 mg/L
Selenium	1 mg/L	23.3 mg/L	1 mg/L	-
Silver	5 mg/L	65.7 mg/L	5 mg/L	-



Notes:

LFS Lunkenheimer Foundry Site  
 VOCs Volatile Organic Compounds  
 ppm parts per million  
 N/A not analyzed  
 SU Standard Units  
 TCLP Toxicity Characteristic Leaching Procedure  
 U Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.

Sample LFS-SW-007-042517 was ran as a waste dilution due to the sample matrix.

Photographed by Karl Schultz



Sample Summary Lunkenheimer Foundry Site Cincinnati, Hamilton County, Ohio				
Sample Designation	LFS-SW-008-dup		LFS-SW-009	
Container Type	Pile on Foundry Equipment		Metal Container	
Matrix	Solids		Solids	
Label Information	N/A 		N/A 	
Field Screening Results				
XRF Reading	1.86% for Lead		3.39 % for Lead	
Lab Results				
Compound	TCLP Regulatory Level	Preliminary Results	TCLP Regulatory Level	Preliminary Results
Arsenic	5 mg/L	-	5 mg/L	-
Cadmium	1 mg/L	2.7 mg/L	1 mg/L	2 mg/L
Chromium	5 mg/L	-	5 mg/L	-
Lead	5 mg/L	27 mg/L	5 mg/L	30 mg/L
Selenium	1 mg/L	-	1 mg/L	-
Silver	5 mg/L	-	5 mg/L	-

Notes:

LFS Lunkenheimer Foundry Site  
 ppm parts per million  
 N/A not analyzed  
 TCLP Toxicity Characteristic Leaching Procedure  
 U Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.  
 Photographed by Karl Schultz




Sample Summary Lunkenheimer Foundry Site Cincinnati, Hamilton County, Ohio				
Sample Designation	LFS-FS-001-042517		LFS-FS-002-042517	
Container Type	Pile on Foundry Equipment		Pile on Foundry Floor	
Matrix	Foundry Sand		Foundry Sand	
Label Information	<div><div>N/A</div><div><div>Apr 25, 2017, 11:10:23 39.12503843,-84.54261179</div></div></div>		<div><div>N/A</div><div><div>Apr 25, 2017, 11:11:26 39.12712445,-84.54600144</div></div></div>	
Field Screening Results				
XRF Reading	1250 ppm for Lead		1177 ppm for Lead	
Lab Results				
Compound	TCLP Regulatory Level	Preliminary Results	TCLP Regulatory Level	Preliminary Results
Arsenic	5 mg/L	-	5 mg/L	-
Cadmium	1 mg/L	-	1 mg/L	-
Chromium	5 mg/L	-	5 mg/L	-
Lead	5 mg/L	9.3 mg/L	5 mg/L	12 mg/L
Selenium	1 mg/L	-	1 mg/L	-
Silver	5 mg/L	-	5 mg/L	-

Notes:

LFS Lunkenheimer Foundry Site  
 ppm parts per million  
 N/A not analyzed  
 TCLP Toxicity Characteristic Leaching Procedure  
 U Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.  
 Photographed by Karl Schultz

**Sample Summary**  
**Lunkenheimer Foundry Site**  
**Cincinnati, Hamilton County, Ohio**

Sample Designation	LFS-FS-003	
Container Type	55-gallon Drum	
Matrix	Foundry Sand	
Label Information	N/A 	

**Field Screening Results**

XRF Reading	2736 ppm for Lead	
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**Lab Results**

Compound	TCLP Regulatory Level	Preliminary Results		
Arsenic	5 mg/L	-		
Cadmium	1 mg/L	-		
Chromium	5 mg/L	-		
Lead	5 mg/L	6.9 mg/L		
Selenium	1 mg/L	-		
Silver	5 mg/L	-		

**Notes:**

LFS     Lunkenheimer Foundry Site  
ppm     parts per million  
N/A     not analyzed  
TCLP    Toxicity Characteristic Leaching Procedure  
U       Analyzed but not detected above the method detection limit

Samples were submitted to CT laboratory for analysis under TDD No. S05-0001-1703-005.  
Photographed by Karl Schultz

**APPENDIX D**  
**DATA VALIDATION REPORT**



May 31, 2017

Mr. Steven Renninger  
On-Scene Coordinator  
U.S. Environmental Protection Agency Region 5  
26 West Martin Luther King Drive  
Cincinnati, Ohio 45268-0001

**Subject: Data Validation Report  
Lunkenheimer Foundry Site  
EPA Contract No. EP-S5-13-01  
Technical Direction Document No. S05-0001-1703-005  
Document Tracking No. 1746**

Dear Mr. Renninger:

Tetra Tech, Inc. (Tetra Tech) is submitting this Data Validation Report for 25 waste samples and three field duplicate samples collected at the Lunkenheimer Foundry site. The samples were collected on April 25, 2017, and were analyzed for polychlorinated biphenyls, total metals, toxicity characteristic leaching procedure metals, pH, and flashpoint by CT Laboratories. The laboratory data package was received on May 18, 2017.

Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Organic Superfund Methods Data Review* (January 2017) and the EPA *NFG for Inorganic Superfund Data Review* (January 2017).

No results were rejected. All may be used as qualified for the reasons discussed in the attachment.

If you have any questions regarding this data validation report, please call me at (312) 201-7756.

Sincerely,

A handwritten signature in black ink that reads 'Gary N. Ellis III'.

START Chemist

Enclosure

cc: Kevin Scott, Tetra Tech Program Manager  
Karl Schultz, Tetra Tech Project Manager  
TDD File

## **ATTACHMENT 1**

### **DATA VALIDATION REPORT CT LABORATORIES REPORT 126906**

**DATA VALIDATION CHECKLIST – STAGE 4**  
**EPA REGION 5 START CONTRACT**

<b>Site Name</b>	Lunkenheimer Foundry Site	<b>TDD No.</b>	S05-0001-1703-005
<b>Document Tracking No.</b>	1746	<b>Technical Reviewer (signature and date)</b>	<i>Jessica A. Vickers</i> May 31, 2017
<b>Data Reviewer (signature and date)</b>	<i>Harry N. Ellis III</i> 30 May 2017	<b>Laboratory</b>	CT Laboratories/Baraboo, Wisconsin
<b>Laboratory Report No.</b>	126906		
<b>Analyses</b>	Polychlorinated biphenyls (PCBs) by SW-846 Method 8082, pH by SW-846 Method 9040C, flash point by SW-846 Method 1010, total metals by SW-846 Methods 6010C and 7471A, and toxicity characteristic leaching procedure (TCLP) metals by SW-846 Methods 1311/6010C and 1311/7470A		
<b>Samples and Matrix</b>	25 Waste samples plus 3 field duplicates		
<b>Field Duplicate Pairs</b>	LFS-SW-001-042517/LFS-SW-001-042517-DUP, LFS-SW-004-042517/LFS-SW-004-042517, and LFS-SW-008-042517/LFS-SW-008-042517-DUP		
<b>Field Blanks</b>	None		

**INTRODUCTION**

This checklist summarizes the Stage 4 validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines (NFG) for Organic Superfund Methods Data Review* (January 2017) and the EPA *NFG for Inorganic Superfund Methods Data Review* (January 2017).

**OVERALL EVALUATION**

No results were rejected, but several were qualified. All may be used, as qualified.

**Data completeness:**

Within Criteria	Exceedance/Notes
Y	



## DATA VALIDATION CHECKLIST – STAGE 4

### EPA REGION 5 START CONTRACT

**Sample preservation, receipt, and holding times:**

Within Criteria	Exceedance/Notes
Y	

**Instrument Performance Checks:**

Within Criteria	Exceedance/Notes
NA	

**Initial Calibration:**

Within Criteria	Exceedance/Notes
Y	

**Continuing Calibration:**

Within Criteria	Exceedance/Notes
Y	

**Calibration Verification:**

Within Criteria	Exceedance/Notes
Y	

**Method blanks:**

Within Criteria	Exceedance/Notes
N	Many of the metals calibration and method blanks yielded low concentrations of one or more of the analytes. However, all associated field sample results were either non-detect or much greater than the blanks; therefore, no qualifications were applied.





## DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

### Field blanks:

Within Criteria	Exceedance/Notes
NA	

### Interference Check Samples (ICS) (ICP metals only):

Within Criteria	Exceedance/Notes
Y	

### System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
N	The initial (undiluted) analyses of the PCB extracts yielded surrogate peaks outside the retention time windows, indicating significant matrix interference. The extracts were analyzed at dilutions that yielded acceptable surrogate results. Only the diluted results were reported; therefore, no qualifications were applied.

### MS/MSD:

Within Criteria	Exceedance/Notes
N	Recoveries and relative percent differences (RPDs) of mercury from the analyses performed on sample LFS-SW-007-042517 and of cadmium and lead from the analyses performed on sample LFS-FS-003-042417 could not be determined because field samples contained more than four times the spike concentrations. No qualifications were applied for these data gaps. Selenium yielded excessive recoveries from sample LFS-FS-003-042517. Because selenium was not detected in the unspiked sample, no qualification was applied.

### Post digestion spikes:

Within Criteria	Exceedance/Notes
NA	



## DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

### Serial dilutions:

Within Criteria	Exceedance/Notes
Y	

### Laboratory duplicates:

Within Criteria	Exceedance/Notes
N	The RPD of mercury from the analysis performed on sample LFS-SW-007-042517 exceeded the acceptance limit; therefore, the mercury result for this sample was qualified as estimated (flagged "J").

### Field duplicates:

Within Criteria	Exceedance/Notes
N	The TCLP cadmium field duplicate result in the pair from LFS-SW-004-042517 yielded about 7 times the concentration in the primary sample, with an absolute difference well over the reporting limit. Due to the uncertainty in the true concentration of TCLP cadmium at that location, the results for that pair were qualified as estimated (flagged "J").

### LCSs/LCSDs:

Within Criteria	Exceedance/Notes
Y	

### Sample dilutions:

Within Criteria	Exceedance/Notes
Y	PCB extracts were analyzed at 10-fold dilutions to minimize matrix interference, thus raising detection and reporting limits. Additionally, several TCLP cadmium results and various total metals results were analyzed at 3- to 100-fold dilutions to place the results within the calibration range. No qualifications were applied.



## DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

### Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

### Second column confirmation (GC and HPLC analyses only):

Within Criteria	Exceedance/Notes
NA	No PCBs were detected.

### Internal Standards:

Within Criteria	Exceedance/Notes
Y	

### Target analyte identification:

Within Criteria	Exceedance/Notes
NA	

### Analyte quantitation and MDLs/RLs:

Within Criteria	Exceedance/Notes
N	<p>Some detected results were less than their sample reporting limits and were flagged “J” by the laboratory to indicate that they are estimated.</p> <p>Most pH results were outside CT’s calibration range of 4 to 10. Both acidic results (measured as zero, but possibly negative) and alkaline results (reported as high as 14, but possibly higher) outside the 4 to 10 range were qualified as estimated (flagged “J”).</p>



**DATA VALIDATION CHECKLIST – STAGE 4**  
**EPA REGION 5 START CONTRACT**

**Tentatively identified compounds:**

<b>Within Criteria</b>	<b>Exceedance/Notes</b>
NA	

**System performance and instrument stability:**

<b>Within Criteria</b>	<b>Exceedance/Notes</b>
Y	

**Other [specify]:**

<b>Within Criteria</b>	<b>Exceedance/Notes</b>
NA	



## DATA VALIDATION CHECKLIST – STAGE 4 EPA REGION 5 START CONTRACT

### Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.



## Lunkenheimer Foundry Waste Sample Results

CT Laboratories Package 126906

Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
LFS-BO-001-042517	860099	Aroclor-1016	500	UV		500	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1221	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1232	900	UV		900	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1242	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1248	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1254	900	UV		900	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1260	600	UV		600	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1262	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-001-042517	860099	Aroclor-1268	500	UV		500	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1016	500	UV		500	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1221	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1232	900	UV		900	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1242	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1248	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1254	900	UV		900	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1260	600	UV		600	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1262	700	UV		700	3000	10 ug/kg	3000	U
LFS-BO-002-042517	860100	Aroclor-1268	500	UV		500	3000	10 ug/kg	3000	U
LFS-FS-001-042517	860118	Arsenic	0.011	J		0.004	0.024	1 mg/L	0.011	J
LFS-FS-001-042517	860118	Barium	0.26			0.00029	0.0018	1 mg/L	0.26	
LFS-FS-001-042517	860118	Cadmium	0.15			0.0003	0.002	1 mg/L	0.15	
LFS-FS-001-042517	860118	Chromium	0.01			0.0006	0.004	1 mg/L	0.01	
LFS-FS-001-042517	860118	Lead	9.3	B		0.0014	0.004	1 mg/L	9.3	
LFS-FS-001-042517	860118	Selenium	0.0022	U		0.0022	0.013	1 mg/L	0.013	U
LFS-FS-001-042517	860118	Silver	0.0007	U		0.0007	0.004	1 mg/L	0.004	U
LFS-FS-001-042517	860118	Mercury	0.00003	U		0.00003	0.00012	1 mg/L	0.00012	U
LFS-FS-002-042517	860119	Arsenic	0.004	U		0.004	0.024	1 mg/L	0.024	U
LFS-FS-002-042517	860119	Barium	0.25			0.00029	0.0018	1 mg/L	0.25	
LFS-FS-002-042517	860119	Cadmium	0.1			0.0003	0.002	1 mg/L	0.1	
LFS-FS-002-042517	860119	Chromium	0.0035	J		0.0006	0.004	1 mg/L	0.0035	J
LFS-FS-002-042517	860119	Lead	12	B		0.0014	0.004	1 mg/L	12	
LFS-FS-002-042517	860119	Selenium	0.0022	U		0.0022	0.013	1 mg/L	0.013	U
LFS-FS-002-042517	860119	Silver	0.0007	U		0.0007	0.004	1 mg/L	0.004	U

## Lunkenheimer Foundry Waste Sample Results

CT Laboratories Package 126906

Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
LFS-FS-002-042517	860119	Mercury	0.00003	U	0.00003	0.00012	1	mg/L	0.00012	U
LFS-FS-003-042517	860120	Arsenic	0.004	U	0.004	0.024	1	mg/L	0.024	U
LFS-FS-003-042517	860120	Barium	0.26		0.00029	0.0018	1	mg/L	0.26	
LFS-FS-003-042517	860120	Cadmium	0.14		0.0003	0.002	1	mg/L	0.14	
LFS-FS-003-042517	860120	Chromium	0.008		0.0006	0.004	1	mg/L	0.008	
LFS-FS-003-042517	860120	Lead	6.9	B	0.0014	0.004	1	mg/L	6.9	
LFS-FS-003-042517	860120	Selenium	0.0022	U	0.0022	0.013	1	mg/L	0.013	U
LFS-FS-003-042517	860120	Silver	0.0007	U	0.0007	0.004	1	mg/L	0.004	U
LFS-FS-003-042517	860120	Mercury	0.000093	J	0.00003	0.00012	1	mg/L	0.00012	J
LFS-FS-004-042517	860121	Arsenic	0.004	U	0.004	0.024	1	mg/L	0.024	U
LFS-FS-004-042517	860121	Barium	0.081		0.00029	0.0018	1	mg/L	0.081	
LFS-FS-004-042517	860121	Cadmium	0.12		0.0003	0.002	1	mg/L	0.12	
LFS-FS-004-042517	860121	Chromium	0.12		0.0006	0.004	1	mg/L	0.12	
LFS-FS-004-042517	860121	Lead	0.19	B	0.0014	0.004	1	mg/L	0.19	
LFS-FS-004-042517	860121	Selenium	0.0022	U	0.0022	0.013	1	mg/L	0.013	U
LFS-FS-004-042517	860121	Silver	0.0024	J	0.0007	0.004	1	mg/L	0.0024	J
LFS-FS-004-042517	860121	Mercury	0.00003	U	0.00003	0.00012	1	mg/L	0.0001	U
LFS-LW-001-042517	860088	pH	14	X	1	0.1	1	S.U.	14	J
LFS-LW-002-042517	860090	Flashpoint	>140				1	Deg. F	140	<
LFS-LW-003-042517	860091	Flashpoint	>140				1	Deg. F	140	<
LFS-LW-004-042517	860092	Flashpoint	>140				1	Deg. F	140	<
LFS-LW-005-042517	860093	pH	12	X	1	0.1	1	S.U.	12	J
LFS-LW-006-042517	860094	Flashpoint	120.6		65	65	1	Deg. F	120.6	
LFS-LW-007-042517	860095	pH	0.1	UX	1	0.1	1	S.U.	0	J
LFS-LW-008-042517	860096	pH	0.1	UX	1	0.1	1	S.U.	0	J
LFS-LW-009-042517	860097	Flashpoint	>140				1	Deg. F	140	<
LFS-LW-010-042517	860098	Flashpoint	100.5		65	65	1	Deg. F	100.5	
LFS-SW-001-042517	860101	pH	11	X	1	0.1	1	S.U.	11	J
LFS-SW-001-042517-DUP	860102	pH	10		1	0.1	1	S.U.	10	
LFS-SW-002-042517	860103	pH	11	X	1	0.1	1	S.U.	11	J
LFS-SW-003-042517	860104	pH	8		1	0.1	1	S.U.	8	
LFS-SW-004-042517	860105	Arsenic	0.0099	J	0.004	0.024	1	mg/L	0.0099	J



## Lunkenheimer Foundry Waste Sample Results

## CT Laboratories Package 126906

Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
LFS-SW-004-042517	860105	Barium	0.16		0.00029	0.0018	1	mg/L	0.16	
LFS-SW-004-042517	860105	Cadmium	0.00043	J	0.0003	0.002	1	mg/L	0.00043	J
LFS-SW-004-042517	860105	Chromium	0.0006	U	0.0006	0.004	1	mg/L	0.004	U
LFS-SW-004-042517	860105	Lead	0.74	B	0.0014	0.004	1	mg/L	0.74	
LFS-SW-004-042517	860105	Selenium	0.0022	U	0.0022	0.013	1	mg/L	0.013	U
LFS-SW-004-042517	860105	Silver	0.0012	J	0.0007	0.004	1	mg/L	0.0012	J
LFS-SW-004-042517	860105	Mercury	0.00003	U	0.00003	0.00012	1	mg/L	0.0001	U
LFS-SW-004-042517-DUP	860106	Arsenic	0.0052	J	0.004	0.024	1	mg/L	0.0052	J
LFS-SW-004-042517-DUP	860106	Barium	0.16		0.00029	0.0018	1	mg/L	0.16	
LFS-SW-004-042517-DUP	860106	Cadmium	0.0029		0.0003	0.002	1	mg/L	0.0029	J
LFS-SW-004-042517-DUP	860106	Chromium	0.0006	U	0.0006	0.004	1	mg/L	0.004	U
LFS-SW-004-042517-DUP	860106	Lead	0.56	B	0.0014	0.004	1	mg/L	0.56	
LFS-SW-004-042517-DUP	860106	Selenium	0.0022	U	0.0022	0.013	1	mg/L	0.013	U
LFS-SW-004-042517-DUP	860106	Silver	0.0007	J	0.0007	0.004	1	mg/L	0.0007	J
LFS-SW-004-042517-DUP	860106	Mercury	0.00003	U	0.00003	0.00012	1	mg/L	0.0001	U
LFS-SW-005-042517	860107	Arsenic	0.011	J	0.004	0.024	1	mg/L	0.011	J
LFS-SW-005-042517	860107	Barium	0.017		0.00029	0.0018	1	mg/L	0.017	
LFS-SW-005-042517	860107	Cadmium	0.81		0.0003	0.002	1	mg/L	0.81	
LFS-SW-005-042517	860107	Chromium	0.0072		0.0006	0.004	1	mg/L	0.0072	
LFS-SW-005-042517	860107	Lead	4.7	B	0.0014	0.004	1	mg/L	4.7	
LFS-SW-005-042517	860107	Selenium	0.013		0.0022	0.013	1	mg/L	0.013	
LFS-SW-005-042517	860107	Silver	0.0014	J	0.0007	0.004	1	mg/L	0.0014	J
LFS-SW-005-042517	860107	Mercury	0.00098		0.00003	0.00012	1	mg/L	0.00098	
LFS-SW-006-042517	860108	Arsenic	0.01	J	0.004	0.024	1	mg/L	0.01	J
LFS-SW-006-042517	860108	Barium	0.04		0.00029	0.0018	1	mg/L	0.04	
LFS-SW-006-042517	860108	Cadmium	2.3		0.003	0.02	10	mg/L	2.3	
LFS-SW-006-042517	860108	Chromium	0.0006	U	0.0006	0.004	1	mg/L	0.004	U
LFS-SW-006-042517	860108	Lead	34	B	0.0014	0.004	1	mg/L	34	
LFS-SW-006-042517	860108	Selenium	0.037		0.0022	0.013	1	mg/L	0.037	
LFS-SW-006-042517	860108	Silver	0.0035	J	0.0007	0.004	1	mg/L	0.0035	J
LFS-SW-006-042517	860108	Mercury	0.0029		0.00003	0.00012	1	mg/L	0.0029	
LFS-SW-007-042517	860109	Arsenic	20.5		0.4	2.5	3	mg/kg	20.5	
LFS-SW-007-042517	860109	Barium	22.7		0.028	0.15	3	mg/kg	22.7	

## Lunkenheimer Foundry Waste Sample Results

CT Laboratories Package 126906

Sample ID	Lab ID	Analyte	Lab result	Lab Qualifier	DL	RL	DF	Units	Val. Results	Val. Qualifiers
LFS-SW-007-042517	860109	Cadmium	662			0.62	4.1	100 mg/kg	662	
LFS-SW-007-042517	860109	Chromium	14.1			0.071	0.43	3 mg/kg	14.1	
LFS-SW-007-042517	860109	Lead	31200			4.1	26	100 mg/kg	31200	
LFS-SW-007-042517	860109	Selenium	23.3			0.19	1.2	3 mg/kg	23.3	
LFS-SW-007-042517	860109	Silver	65.7			1.8	10	100 mg/kg	65.7	
LFS-SW-007-042517	860109	Mercury	0.42 MY			0.0022	0.0086	1 mg/kg	0.42 J	
LFS-SW-008-042517	860110	Arsenic	0.0074 J			0.004	0.024	1 mg/L	0.0074 J	
LFS-SW-008-042517	860110	Barium	0.066			0.00029	0.0018	1 mg/L	0.066	
LFS-SW-008-042517	860110	Cadmium	2.9			0.003	0.02	10 mg/L	2.9	
LFS-SW-008-042517	860110	Chromium	0.0012 J			0.0006	0.004	1 mg/L	0.0012 J	
LFS-SW-008-042517	860110	Lead	30 B			0.0014	0.004	1 mg/L	30	
LFS-SW-008-042517	860110	Selenium	0.043			0.0022	0.013	1 mg/L	0.043	
LFS-SW-008-042517	860110	Silver	0.0032 J			0.0007	0.004	1 mg/L	0.0032 J	
LFS-SW-008-042517	860110	Mercury	0.0026			0.00003	0.00012	1 mg/L	0.0026	
LFS-SW-008-042517-DUP	860111	Arsenic	0.0077 J			0.004	0.024	1 mg/L	0.0077 J	
LFS-SW-008-042517-DUP	860111	Barium	0.083			0.00029	0.0018	1 mg/L	0.083	
LFS-SW-008-042517-DUP	860111	Cadmium	2.7			0.003	0.02	10 mg/L	2.7	
LFS-SW-008-042517-DUP	860111	Chromium	0.0013 J			0.0006	0.004	1 mg/L	0.0013 J	
LFS-SW-008-042517-DUP	860111	Lead	27 B			0.0014	0.004	1 mg/L	27	
LFS-SW-008-042517-DUP	860111	Selenium	0.037			0.0022	0.013	1 mg/L	0.037	
LFS-SW-008-042517-DUP	860111	Silver	0.0031 J			0.0007	0.004	1 mg/L	0.0031 J	
LFS-SW-008-042517-DUP	860111	Mercury	0.0022			0.00003	0.00012	1 mg/L	0.0022	
LFS-SW-009-042517	860112	Arsenic	0.0079 J			0.004	0.024	1 mg/L	0.0079 J	
LFS-SW-009-042517	860112	Barium	0.052			0.00029	0.0018	1 mg/L	0.052	
LFS-SW-009-042517	860112	Cadmium	2			0.003	0.02	10 mg/L	2	
LFS-SW-009-042517	860112	Chromium	0.00077 J			0.0006	0.004	1 mg/L	0.00077 J	
LFS-SW-009-042517	860112	Lead	30 B			0.0014	0.004	1 mg/L	30	
LFS-SW-009-042517	860112	Selenium	0.027			0.0022	0.013	1 mg/L	0.027	
LFS-SW-009-042517	860112	Silver	0.0031 J			0.0007	0.004	1 mg/L	0.0031 J	
LFS-SW-009-042517	860112	Mercury	0.0035			0.00003	0.00012	1 mg/L	0.0035	

**APPENDIX E**  
**ENVIRONMENTALLY PREFERRED PRACTICES**

<b>TDD #:</b>	S05-0001-1703-005
<b>Site Name:</b>	Lunkenheimer Foundry Site
<b>Site City, State:</b>	Cincinnati, OH
<b>Site Project Manager:</b>	Karl Schultz
<b>EPA OSC:</b>	Steve Renninger

Environmentally Preferred General Field Practices				
If a general category is not applicable, then check N/A for the category box, not for each subcategory.	N= Not Used	N/A= Not Applicable	Y = Yes Implemented	Comments Section Justify in the comments for each BMP field as to why the practice was not used, not applicable, or implemented.
<b>Energy</b>				
<b>Use of Energy Efficient Equipment</b>				
Computer Equipment (FEMP/Energy Star)			Y	
Installation of Electric Service		NA		
<b>Reduce Carbon Emissions from Transportation</b>				
Use Internet Based Meetings/Conferences			Y	
Maximize Carpooling			Y	
Use of Local Labor/Suppliers/Waste Disposal Facilities (50 mile radius)		NA		
No idling, except for extreme weather conditions			Y	
Use of Alternative Fuels, if available within 10 miles		NA		
Properly Inflated Tires			Y	
Email Small Files (less than 8MB)			Y	
Reusable Electronic Storage Media or the Cloud			Y	
<b>Water</b>				
Use of Low Flow Sampling Pumps		NA		
<b>Waste</b>				
Use of Local Recycling Programs		NA		
Use of Rechargeable Batteries			Y	
Recycling – Other			Y	
Plastic Reduction			Y	
Reuse of Resources		NA		
Direct Push Boring		NA		
<b>Materials</b>				
<b>Printing when Required</b>				
Double-sided Printing			Y	
100% post-consumer recycled paper			Y	

Environmentally Preferred General Field Practices				
If a general category is not applicable, then check N/A for the category box, not for each subcategory.	N = Not Used	N/A = Not Applicable	Y = Yes Implemented	Comments Section Justify in the comments for each BMP field as to why the practice was not used, not applicable, or implemented.
<b>Land &amp; Ecosystems</b>				
Minimize Disruption to Natural Vegetation		NA		
Use of Non-invasive Investigation Techniques		NA		
<b>Environmentally Preferred</b>				
<b>Green Procurement</b>				
Environmentally Preferred Vendors	N			
Green Lodging/Hotels	N			
Use of Green Laboratories	N			